Partnerships in Conservation Education

"Bringing the Message Home"

Learning to be Water Wise & Energy Efficient™

Youth Education Program

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Project Summary Information

The ***"Learning To Be Water Wise & Energy Efficient"*** youth education program is being coordinated by The Subsidence District through partnerships with public and private water suppliers. It combines an educational curriculum that teaches how to consume less water and energy by combining high efficiency plumbing equipment and new water smart habits. The program is being offered each year to over 55,000 fifth grade students in the Texas upper gulf coast areas including Harris, Galveston and Fort Bend Counties. ***"Learning by doing"*** is the main ingredient of this curriculum. Each student and teacher participating receives a water conservation instructional materials package that teaches a number of behaviors to alter wasteful habits, and a kit that includes a low-flow showerhead, low-flow kitchen and bathroom aerators, water/rain gauge, water heater temperature check device and leak detection tablets. Each unit is specifically designed to give teachers, parents and students the "hands-on" experience of installing and monitoring water and energy conservation equipment. The students, with the help of their parents, install the devices and complete home energy checkups. The fundamental assumption underlying this program is that school children can influence their parents' water and energy use patterns quickly and effectively. This program reaches a broad audience and reinforces our beliefs that our most precious resource, our children, will be the ones to teach generations, past and present, how to save another precious resource, our water!

The ***"Learning To Be Water Wise & Energy Efficient"*** Youth Education Program was introduced to the District in 1994. It was a timely introduction as the District was researching options for aggressive water conservation projects for school students. The Subsidence District is a government entity that regulates groundwater pumpage along the Gulf Coast of Texas to control subsidence. To achieve this end, the Subsidence District adopted a regulatory action plan that pumpage reduction of at least 80% can be reached no later than 2020. The Board of Directors realizes the economic effects of the plan and has, therefore, adopted a strong resolution to help our area develop and implement strong water conservation measures.

History of the Program

In Fall, '91, a study, ***"Effectiveness of Retrofit In Single Family Residences And Multi-Family Projects"*** was sponsored by the Texas Water Development Board, Harris County Municipal Utility District #55 and The Subsidence District. Its principal purposes included assessing the cost-effectiveness of retrofit

plumbing devices with respect to water and energy savings; determining user satisfaction with the devices; and providing information useful to water utilities throughout the State of Texas.

Results from the single family residence portion of the study indicated that installation of the three retrofit devices; showerhead, kitchen aerator and bathroom aerator, resulted in an average monthly water savings of over 1,400 gallons of the average consumption for such a residence. Given the number of household residents in the study, these water savings amounted to approximately 14.13 gallons per person per day.

Telephone surveys conducted by the researchers revealed that sizeable majorities (97%) were "very satisfied" with all three water-conserving devices.

The findings of this study suggested three important conclusions. First, installation of water-conserving plumbing devices of the quality utilized in this study is quite cost-effective. Of course, "devices of the quality utilized in this study" is an important qualifier. Second, from a regional or community-wide viewpoint, i.e. aggregating the savings from a number of individual households and apartments, the widespread installation of "good quality" retrofit devices will result in major water and energy conservation. Finally, prospective users can expect to be highly satisfied with the performance of "good quality" retrofit, plumbing devices as well as to perceive readily the resulting savings.

The plumbing devices used in the study are the devices that the ***"Learning To Be Water Wise & Energy Efficient"*** program was designed to accommodate. The instructional materials were developed by the National Energy Foundation which is a non-profit educational organization devoted to the development of instructional materials and the implementation of innovative teacher training and student programs.

The Subsidence District realizes that the education of our young people will have the most benefit over the longest term, and looked for a program that would involve the students, teachers and their families and homes. The ***"Learning To Be Water Wise & Energy Efficient"*** program addressed all of these areas. The target audience over this large area includes 34 school districts, 500+ elementary schools, and numerous public water suppliers.

Innovative Aspects of the Program:

1. The program addresses an important subject; water and energy conservation.
2. The program encourages water and energy conservation practices at home.
3. Students become involved in active, meaningful learning.
4. The content relates to the required school curriculum. The program teaches many concepts required in the elementary curricula. Many science curricula include concepts about water use as well as related actions that foster good stewardship of the environment. Math games and problems enable students to practice their emerging math skills. Word searches and puzzles provide opportunities to use communications and language arts skills. Teacher-led discussions about water use policies can relate to the social studies curriculum. Optional art activities are also included.
5. The program involves parents in significant activities with their children. Parents, all too often, are

left out of the learning process involving their children. This is true despite the widely-held view that parents can provide needed support and encouragement to their children's learning. This program involves parents extensively.

6. The program is easily managed by the teacher, very "teacher friendly"!

Incentives for the Program

The program also utilizes a unique system to remove the disincentive for water conservation, called the Groundwater Bank.

The Subsidence District has developed an incentive package to encourage participation and partnerships in the program with a ***"groundwater banking credit"*** for participating sponsors:

- The Sponsor shall receive a Certificate of Deposit for water conservation credit equal to 84,000 gallons of groundwater for each student sponsored each year. This amount was computed by multiplying the 1400 gallon savings resulting from the MUD#55 Study referred to earlier in this application, multiplied by 12 months and then multiplied by 5 years.

- The Sponsor may hold, transfer, sell or redeem the Groundwater Certificate of Deposit at any time during the next 40 years.

- Redemption of the Certificate of Deposit requires the Subsidence District to increase the redeemer's groundwater allocation by the amount of the water conservation credit. This absolute right to increase the groundwater allocation does not in any way affect the other terms and conditions of the groundwater permit and all groundwater withdrawals will be subject to the permit fees and other rules of the District in effect at the time of the permit.

Benefits to the Environment

This project benefits the environment through water conservation and energy conservation. Both the changed water use habits created through the educational aspect and the actual water saved by the plumbing retrofit devices will directly result in water savings. The energy savings will occur as less energy is used to heat the water for showers. The realized water savings are primarily directed at sink and shower use and will also directly result in less water being generated, creating new wastewater capacity in existing plants and lowering the amount of discharge to the environment.

Measuring the Success of the Program

The Subsidence District's Study, ***"Effectiveness Of Retrofit In Single Family Residences And Multi-Family Projects,"*** reported an average water savings of 1,400 gallons per month, per household in 600 area homes after installation of the fixtures in the ***"Learning To Be Water Wise and Energy Efficient"*** kit.

Using a much more conservative, but widely accepted range of 400 to 500 gallons per month for fixtures of this type and expanded area wide, the **fifth grade class of '96 will save 300,000,000 gallons** of groundwater and waste water every year, for years to come. Five years of the program at the fifth grade level in an area this size will conserve:

4,500,000,000 Gallons of Groundwater
4,500,000,000 Gallons of Waste Water
23,000,000 Therms of Natural Gas, or
470,000,000 Kilowatt Hours of Electricity, and
165,000 Tons of Air Pollutants

These impact estimates are well below those in the engineering data. Conservation could easily exceed the above amounts 25 to 30 percent. Even at the minimums, however, the concept of ***"education with empowerment"*** is certainly the most cost-effective, long term, home conservation and utility cost containment program yet initiated in the United States. It goes well beyond any other available measures in reducing residential water shortages, water quality problems, overpumping of groundwater, overtaxing and costly building of municipal sewers and waste treatment facilities, excessive draw down of natural gas reserves and the needless construction of new power plants and dams.

Interaction With State Education Agencies

The ***"Learning To Be Water Wise & Energy Efficient"*** program has been designed to use from 4th to 8th grade. The Texas Education Agency has certified the program in their Texas Environmental Education Advisory Council (TEEAC) Program. The Subsidence District is able to offer in-service workshops to teachers and they receive credit toward their environmental certificates. The in-service workshops are three hours and six hours in which water issues, resources, teaching methods and application of materials is taught.

Partnership Goals

The Subsidence District is coordinating this regional program and putting together partnerships between public water suppliers, ie: cities, water authorities, utility districts, and the public schools. The District is also working with private business and corporations to partner with private and home school organizations.

Exceptional Aspects of the Program

- **First**, it combines education with implementation, which will provide highly effective results.
- **Second**, it combines changes in water use habits (an active element) with plumbing retrofit devices (a passive element).

- **Third,** it creates partnerships between schools, water suppliers, residents, and the regulatory agency.

- **Finally,** the Groundwater Bank CD's create a unique incentive to conserve.

Because of the difference in cost between groundwater and surface water, these certificates may actually result in a positive cash flow for the sponsors. The effort of the certificate is twofold: **1)** It removes the financial and regulatory disincentives for water suppliers to promote water conservation and **2)** it transfers groundwater pumpage from 1994 to some point in the future, allowing the conservation habits to take hold, resulting in greater overall water savings.

Success of the Program

The "Learning To Be Water Wise & Energy Efficient" program began in the Fall, '94 school term. At the beginning of the school term in 1996, there were 60,000+ Th grade students who had participated in the program. Every school district in the three-county area has schools participating and several districts have all of their schools involved. The District plans to continue this project for a five-year period and will do that on a year to year basis as the evaluations determine that the program is achieving the results required.

Learning to be
Water Wise & Energy Efficient™

An Education Conservation Program

LEARNING TO BE WATER WISE & ENERGY EFFICIENT KEEPS GROWING & ENERGIZING!!

During the first year 1994-95
20,000+ students participated

During the 1995-96 school year,
40,000+ students participated

and in the '96-'97 school year
the numbers are going to exceed the previous two years!

The cooperation of Cities and Water Districts, along with the private sector in this unique partnership is unprecedented as they recognize the long-term benefits of participation in educational programs for future generations.

Partners are increasing each year:
12 Municipalities
100+ Water Utility Districts
5 Private/Corporate Entities

'LEARNING TO BE WATER WISE & ENERGY EFFICIENT' IS THE RECIPIENT OF:

"1996 Governor's Award for Environmental Excellence"
in Education/Clean Texas 2000

"1996 Outstanding Water Conservationist of the Year"
Texas Water Conservation Association

"1995" Leadership in Water Conservation Award"
Educational Mentor Category
U.S. Department of Interior's Bureau of Reclamation

NATIONAL ENERGY FOUNDATION
RESOURCES FOR EDUCATION